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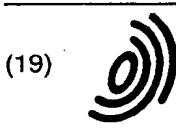
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## EUROPEAN PATENT APPLICATION

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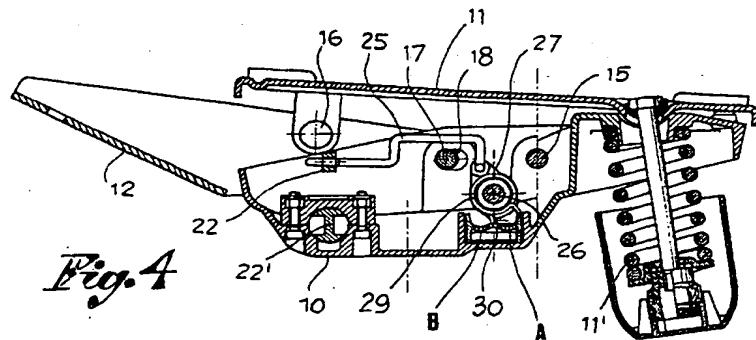
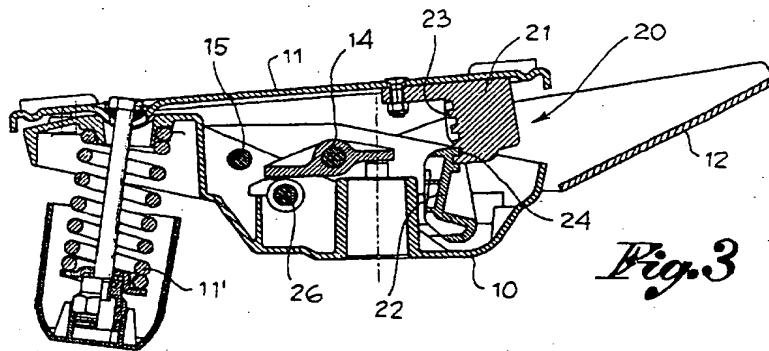
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## (54) Device to lock the oscillating support of a chair seat in various positions

(57) A chair of the type either with an oscillating seat or with a seat and backrest having synchronized movements, equipped with a selector device comprising a toothed block (21) with a number of positioning teeth (23) spaced in height and fixed to the oscillating support (11) of the seat, a hooking element (22) fitted oscillating in the stationary box-body (10) and having at least one

tooth (24) designed to combine selectively with the teeth of the toothed block (21), and of the pre-selection facilities (26, 27, 28, 29, 30) for the movements of the hooking element (27) towards and away from the toothed block, respectively for locking and unlocking the seat in each one of the positions of use.



## Description

The present invention pertains to chairs, especially office chairs, of the type comprising: a stationary box-shaped body fixed onto a supporting base, an oscillating support hinged onto said body and supporting the seat, and a mechanical device for locking/unlocking the oscillating support, and therefore the seat, with respect to the stationary body.

In such chairs, the locking/unlocking device is used as a selector to vary the horizontal arrangement of the oscillating support and to establish correspondingly many positions of the seat, for a more comfortable and handier use of the chair.

Locking/unlocking devices with such a function have already been proposed, placed and operating between the fixed box-body and the oscillating support and controlled by a control lever through a rigid connecting tie-rod.

It is however an object of the present invention to propose an original position-selector device for chairs, either with an oscillating seat or with a seat and backrest having synchronized movements, achieved through a new combination of elements and equipped with pre-selector facilities in axis with the control lever between this and the connecting tie-rod also for handier assembly and greater reliability of the device.

The selector device proposed herein is basically as claimed in claim 1.

It shall however be described more in detail in the continuation of the description, made with reference to the accompanying drawings which are approximate and not limiting and which show a preferred embodiment.

In the drawings:

Figure 1 is a plan and a partial cross-sectional view of the oscillating unit complete with the selector device according to the invention;

Figure 2 is a side view of the unit in Fig. 1;

Figure 3 is a cross-sectional view according to line III-III in Fig. 1;

Figure 4 is a cross-sectional view according to line IV-IV in Fig. 1; and

Figure 5 is a detailed view of the pre-selector facilities.

In said drawings, the oscillating unit for chairs essentially comprises a stationary box-body 10, an oscillating support 11 for the seat and an oscillating support for the backrest 12.

The box-body 10 has a fixed arrangement. It is fixed to the top of a supporting upright 13 - see Fig. 2 - that rises up from a base (not shown). This upright usually consists of a so-called gas spring extending in height through the control of a lever 14 fitted on one side of the box-body.

The oscillating support 11 of the seat is hinged, at its front portion, to a front portion of the fixed box-body 10 with a shaft 15 oriented transversely to the seat - see

Fig. 1 - and so that said support extends protruding backwards with the possibility of oscillating over the fixed body 10 opposed by a spring 11'.

The oscillating support 12 for the backrest is fixedly connected to the rear portion of the support of the seat 11 by means of concentric side pins 16 parallel to the oscillating shaft 15 and so that the two supports 11, 12 can oscillate together in response to the oscillation of one of them. Moreover, at its front portion - see Figures 1 and 4 - the backrest support 12 is also hinged to the fixed box-body 10 on a transverse shaft 17 parallel to the oscillating shaft 15 of the seat support 11. The hinge shaft 17 is fixed to the support of the backrest 12 and extends in slotted or eccentric holes 18 obtained in the walls of the fixed box-body 10 for the support 12 to slide in relation to said body after the joint oscillations with the seat support 11.

Between the fixed box-body 10 and the oscillating support 11 of the seat a selector device 20 is provided such as to lock said support, and with it the support of the backrest 12, in several positions and thereby allow changing the tilt of the seating elements on the box body that stays fixed.

The selector device comprises a toothed block 21 and a hooking element 22 which are adjacent and interacting. The block 21 is fixed to the bottom face of the seat support 11 - see Fig. 3 - and has a number of horizontal positioning teeth 23 spaced in height. The hooking element 22 is fitted oscillating on an axis 22' in the fixed box-body 10 for its angular movement towards and away from the block 21. The hooking element 22 has at least one tooth 24 turned towards and destined to combine with the positioning teeth 23 of said fixed block.

For its angular movements, the hooking element 22 is connected at one end of a rigid tie-rod 25 whose opposite end is connected to a control lever through a pre-selection connecting rod 27. Said control lever 26 is to the side of the fixed body 10, on the opposite side to the lever 14 controlling the height of the seat through the extending upright 13.

More specifically, the pre-selection connecting rod 27 is not keyed, but is free on the control lever 26 and is held axially by an eccentric support 28 which is fixed to the control lever 26. Said pre-selection connecting rod 27 has a first arm that is connected to the rigid tie-rod 25, a second arm turned in the opposite direction to the first one, and a central neck that supports a connecting spring 29 of the helical type whose two ends are held by opposite sides of the second arm and of the eccentric support 28 so that the spring is pre-loaded. On its part, the eccentric support 28 fixed to the lever 26 has a lobe 28' designed to interact alternately with two loops of an elastic check element 30 designed to define two positions of the lever A-B - see Fig. 4.

In the drawings the arrangement of the selector device 20 is clear along with its possibility to interact with the oscillating support 11 to lock the latter in several positions of tilt. It is sufficient to turn the control lever 26 to lock and unlock the device 20 by means of

the tie-rod 25. Then, a movement of the tie-rod 25 in the direction of the arrow F in Fig. 1 tends to move the hooking element 22 further away from the toothed block 21 so as to release the tooth 24 of the first from the teeth 23 of the second. However, the movement of the hooking element 22 is not simultaneous with the rotation of the control lever 26, but delayed since the teeth 23, 24 are still engaged at least for the load weighing on the seat and therefore on the joined elements 21, 22.

In practice, the pre-selection connecting rod 27 and the tie-rod 25 connected to it are not moved by the control lever 26 directly, but indirectly through the eccentric support 28 and the connecting spring 29. The operation of the control lever 26 causes the eccentric support to rotate from position A to position B - see Fig. 4 - and the spring 29 to load, whose action, in its turn, will cause the connecting rod 27 to rotate and the tie-rod 25 to move in the direction of moving the hooking element 22 away from the toothed block 21.

With a rotation of the lever 26 in the opposite direction, the eccentric element 28 returns from position B to position A and in this case the connecting spring 29 acts to turn the connecting rod 27 in the opposite direction and through this to move the tie-rod 25 in the direction of moving the hooking element 22 closer to the toothed block restoring the lock on the oscillating support and therefore the seat in the desired position.

### Claims

1. A chair of the type either with an oscillating seat or with a seat and backrest having synchronized movements, comprising: a stationary box-body (10) fixed on a support base (13); an oscillating support (11) hinged to said box-body (10) and bearing a seating facility; a possible oscillating support (12) for a backrest hinged to said box body and to said oscillating support (11) for the seat; and a selector device (20) locking/unlocking the oscillating support (11) and therefore the seating facilities on the stationary body (10) so as to vary the tilt of the oscillating support and to define many positions of use of the seating, characterized in that said selector device comprises a toothed block (21) having a number of positioning teeth (23) spaced in height and fixed to the bottom face of said oscillating support (11) of the seat, a hooking element (22) fitted oscillating in the stationary box-body (10) and having at least one tooth (24) turned towards and designed to combine selectively with the positioning teeth of said toothed block (21), and of pre-selection facilities (26, 27, 28, 29, 30) for the movements of the hooking element (22) towards and away from the toothed block, respectively to lock and unlock the seat in each of the positions of use.
2. A chair according to claim 1, wherein said pre-selection facilities comprise a control lever (26), rotating, set on one side of said stationary box-body

(10), an eccentric support (28) keyed and rotating with said control lever (26), a pre-selection connecting rod (27) rotating on said control lever (26) and held axially by said eccentric support (28), a rigid tie-rod (25) connecting said pre-selection lever (27) with said hooking element (22) interacting with the toothed block (21), and at least one connecting spring (29) set between said pre-selection connecting rod and said eccentric element (28), said connecting spring (29) interacting with said eccentric element (28) loading itself to transmit the rotation of the control lever (26) to the pre-selection connecting rod (27) and determining, through the rigid tie-rod, the oscillations of locking and unlocking the hooking element (22) with the toothed block (21).

3. A chair according to claim 2, wherein said eccentric element (28) has a lobe (28') interacting with an elastic checking element (30) to define two positions of rotation of the control lever (26) corresponding to locking and unlocking the hooking element with the toothed block.

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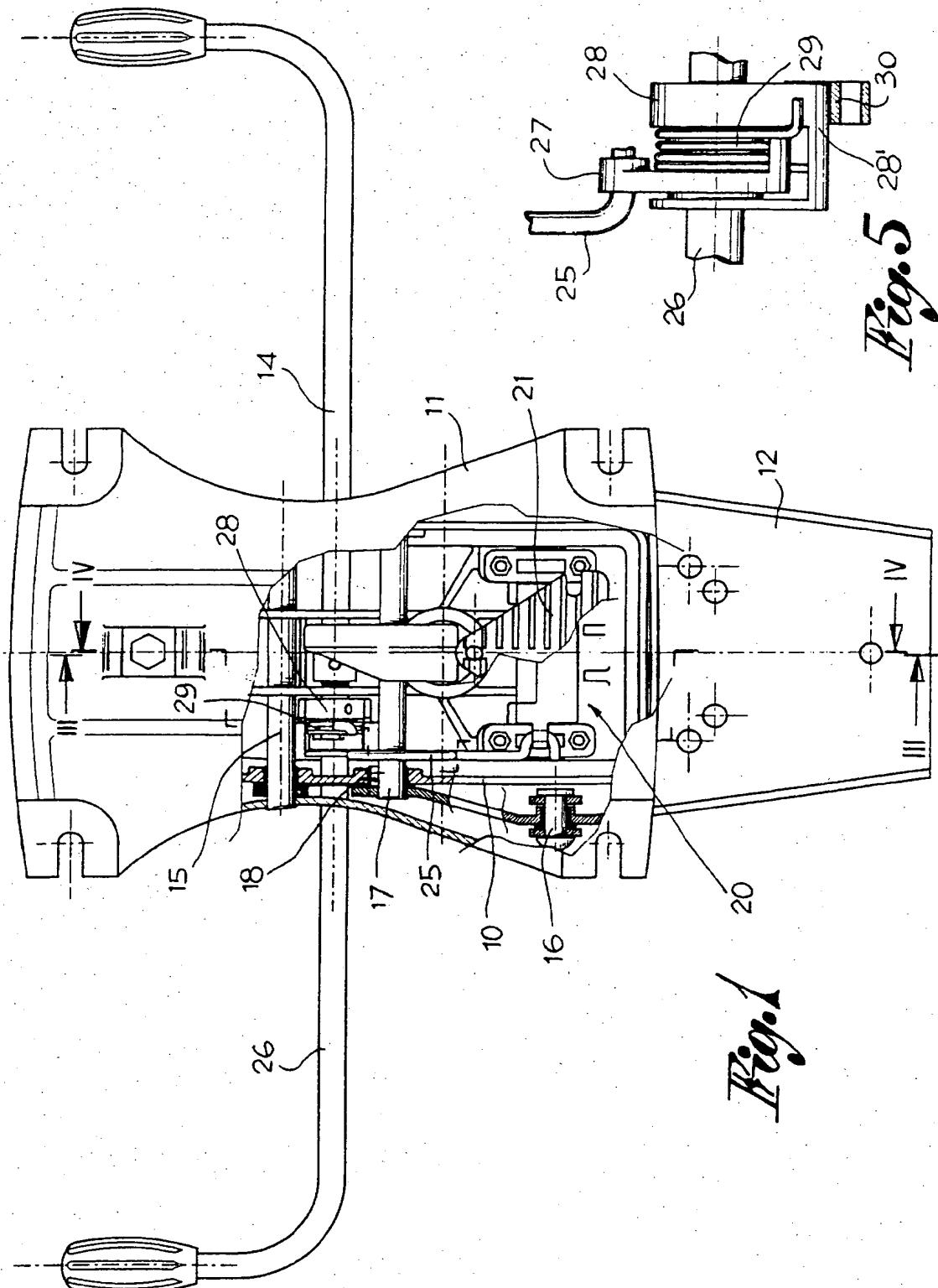
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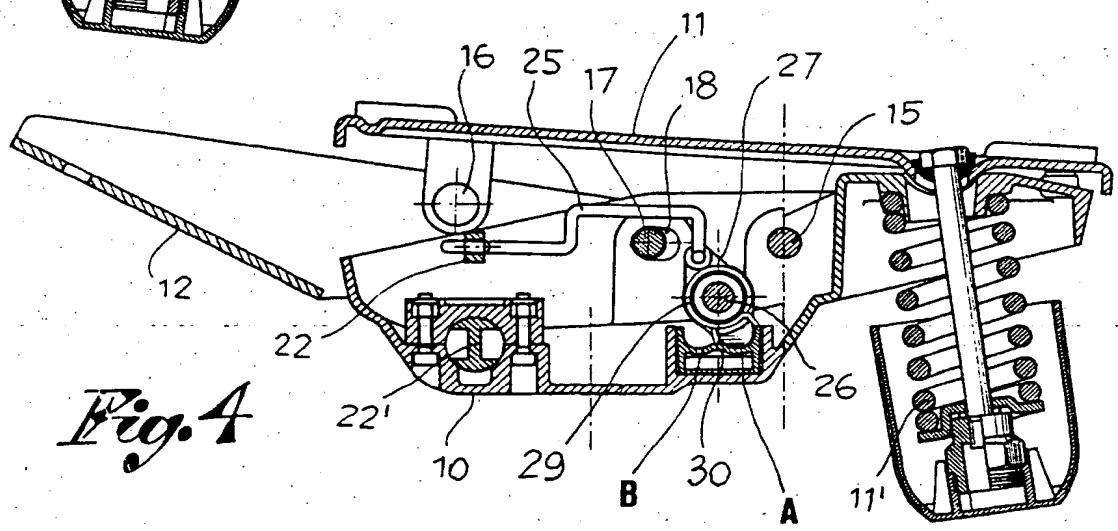
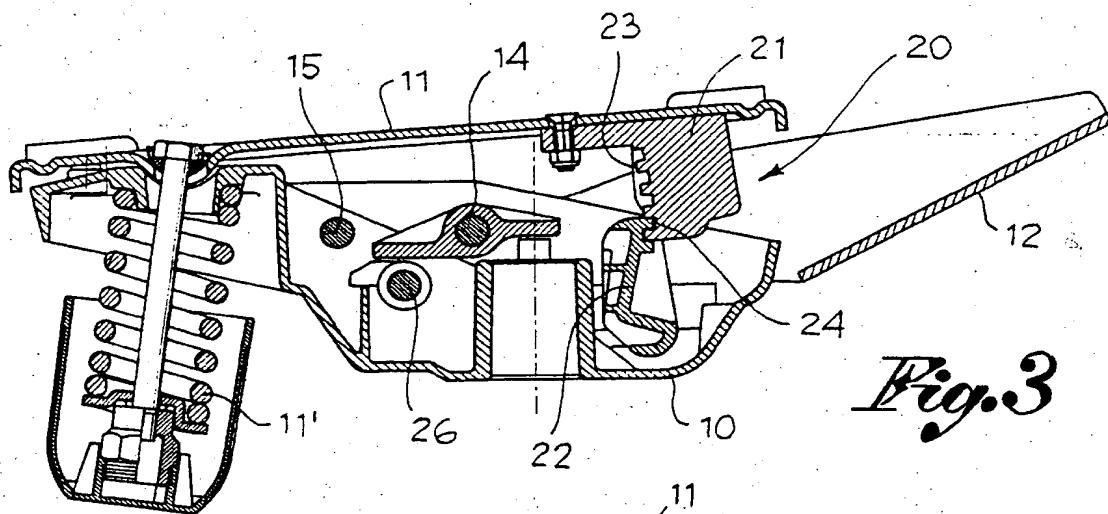
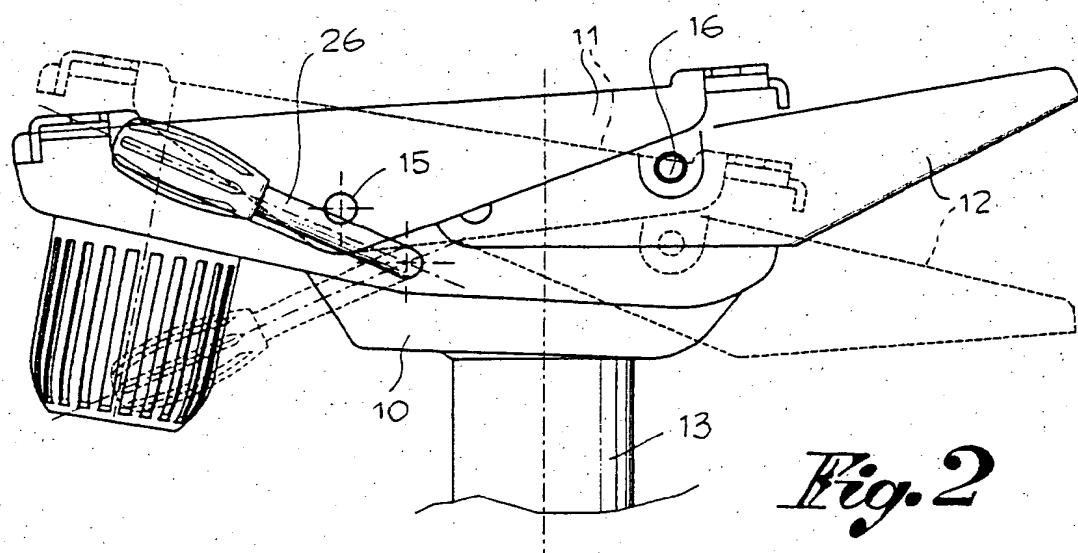
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Fig. 5 28' 30'





## EUROPEAN SEARCH REPORT

Application Number

DOCUMENTS CONSIDERED TO BE RELEVANT			EP 95830527.8						
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 6)						
X	DE - A - 3 638 273 (THONET) * Fig. 1 *	1	A 47 C 3/025						
A	EP - A - 0 568 233 (STEELCASE) * Fig. 1 *	1, 2							
A	US - A - 5 259 663 (AMBASZ) * Fig. 2-5 *	1							
TECHNICAL FIELDS SEARCHED (Int. Cl. 6)									
A 47 C 3/00									
<p>The present search report has been drawn up for all claims</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Place of search</td> <td style="width: 33%;">Date of completion of the search</td> <td style="width: 34%;">Examiner</td> </tr> <tr> <td>VIENNA</td> <td>19-06-1996</td> <td>BENCZE</td> </tr> </table>				Place of search	Date of completion of the search	Examiner	VIENNA	19-06-1996	BENCZE
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<b>CATEGORY OF CITED DOCUMENTS</b> X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document							